

Clinical Conditions And Interventions: Their Relationship To Outcomes Outcomes That Reflect Clinical Practice

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Abstract

The use of patient outcomes to describe and measure nursing practice is not a new phenomenon. The use of patient outcomes has been documented since the early efforts of Florence Nightingale. Throughout the following years numerous studies using outcome measures were conducted in hospitals, nursing homes, and community settings. These outcomes are described most frequently in the nursing literature in terms of physiological status, psychosocial status, safety, functional ratings, behavioral measures, knowledge, symptom control, home functioning, family strain, quality of life, goal attainment, patient satisfaction, caring achievement, nursing diagnosis resolution, and utilization.

The relationship of outcomes to process and structure variables requires a naming and categorization of these variables. Consensus about the naming of the variables is needed among nurses in practice, in research, and in organized nursing. The clinical testing of these variables is the basis for a clinical research outcome agenda. The seating of these variables into large data sets such as Medicare claims data and uniform clinical data sets will enhance the ability of researchers to identify patterns of effective nursing care. The challenge for the research agenda is to build upon the outcome work that has already been done within nursing and to move the past and present nursing research into an interdisciplinary effort where the impact of multiple interventions and providers can be studied.

Outcomes That Reflect Clinical Practice

The use of patient outcomes in the measurement of effectiveness in health care is not a new phenomenon in nursing. Florence Nightingale was one of the earliest, if not the earliest, proponents of outcome evaluation, demonstrated by her use of mortality and morbidity statistics to portray to the public the terrible standards of care experienced by the military personnel in the Crimean War (Nightingale, 1858). There is little question that care delivered by the three million nurses in the United States makes a difference in health outcomes. Nurses are a major component of the health care delivery team and system. Yet data on what these nurses do (interventions and treatments), for what type of patient/client populations, problems/conditions or diagnoses, and with what results or outcomes are virtually unavailable. The fact that nurses care for thousands of patients and yet data describing patient conditions, interventions, and outcomes, and the variations that are relevant to nursing are not available is a major challenge for our research agenda.

This paper is written from a disciplinary view because the authors feel a disciplinary view is necessary in order to enter into interdisciplinary work. The purpose of this paper is to present an overview of the past and present use of outcome measures in evaluation of the effectiveness of nursing practice. In addition, recommendations for a future research agenda is discussed.

Definition of Outcome

The construct of outcome is highly complex. An outcome is most commonly defined most commonly as an end result of a treatment or intervention. This definition has several components. First, is the determination of the outcome measure to represent the end result. For example, is the outcome measured by mortality, functional status, self care ability, satisfaction, financial savings, or some combination of measures? A second component of the definition is the determination of when the end point occurs. The outcome of some prevention interventions may not be recognizable for several years, whereas some treatments may produce immediate results. In addition, some interventions may require multiple measurement times to determine effectiveness of a treatment. Thirdly, there is the treatment or intervention. Is the treatment a type of care delivery, such as case management, or a specific intervention like a bowel management program?

Finally, there is the identification of the problem, diagnosis, or population for which the treatment is done and to which the outcomes are related. The way outcomes are linked influences what aspects of care will be examined for effectiveness. Outcomes are most frequently linked to medical diagnoses (Fitzgerald, Moore, & Dittus, 1988; Decker, Stevens, Vancini, & Wedeking, 1979; Jones, Jones, & Katz, 1989; Wolf, Lesic, & Leak, 1986; Tarlov et al, 1989) and medical treatments (Wennberg, 1984; Anderson, 1977; Barry et al, 1988). However, other examples of outcome linkages include nursing diagnoses (Kerr, Rudy, & Daly, 1991; Harris, 1991), nursing interventions (Heater, Becker, & Olson, 1988; Hjelm-Karlsson, 1989; Hyman et al, 1989; Hodnett & Osborn, 1989), site of care (Hartz et al, 1989; Rooks et al, 1989; Knause et al, 1989; Chassin et al, 1989), and type or organization of care delivered (Greenfield et al, 1975; Hinshaw, Scofield, & Atwood, 1981; Liem, Chernoff, & Carter, 1986). To what extent should the fifteen years of work on nursing diagnosis be further developed, tested, and

included in the studies linking problems, interventions, and outcomes (North American Nursing Diagnosis Association, 1987; Fitzpatrick et al, 1989)?

Health care is a multidimensional phenomena. It is provided in multiple sites, by multiple providers, with multiple environmental and organizational variables influencing the effectiveness. However, health care outcomes are frequently viewed related to one dimension such as site of care, usually the acute care facility. The challenge is to expand the concept of care beyond one episode to a continuum of care so that longitudinal outcomes can be identified, as well as the relationship between multiple sites and providers of care examined.

Historical Overview of the Use of Outcome Measures in Nursing

Aydelotte (1962) used patient welfare as an outcome of nursing care. In her study, clinical measures of outcomes, which were easily retrievable from the patient's record, included the number of days in bed, fever days, post-operative days, and doses of narcotics, analgesics, and/or sedatives. Outcomes measured were patient's mental attitude, physical independence, special aspects of physical independence, mobility, skin condition, patient's opinion of care given, and physician's evaluation of patient's condition and progress.

In the 1970's, outcome measures were emphasized as a measurement of the quality of care. The American Nurses Association (ANA) developed 17 sets of outcome criteria for use in the review of nursing care within the Professional Standards Review Organizations (PSRO's) (American Nurses Association, 1976). Examples of outcome measures included knowledge of condition, compliance with treatment, pain level, mobility, and physical status.

Also during this time, the Joint Commission of Accreditation of Hospitals (JCAH) emphasized the use of outcome criteria with the implementation of the PEP (Performance Evaluation Procedure) primer methodology (Joint Commission of Accreditation of Hospitals, 1975). Many sets of outcome criteria were developed during the 1970's and may still exist. Unfortunately, most of this work cannot be retrieved from published literature.

Examples of published literature include Hover and Zimmer (1978) who offered a classification of five categories of outcomes derived from an examination of 35 previously developed sets of outcome criteria. The classification categories are: (1) knowledge of illness and its treatments, (2) skills, (3) knowledge of medications, (4) adaptive behaviors, and (5) health or physiologic status.

Horn and Swain (1978) developed an outcome classification consisting of a total of 539 measurement items categorized into eight universal and ten health deviation self-care demand dimensions based upon the work of Orem. Each dimension also was classified into four domains which were: (1) requirements met (physiological), (2) knowledge, (3) skills and performance abilities, and (4) motivation. The work of Horn and Swain has provided a comprehensive instrument for measuring patients' health status using a number of dimensions under the influence of nursing care.

Daubert's early work on home care classification was based on rehabilitation potential (Daubert, 1979). Outcomes were classified into the categories of recovery, self-care, rehabilitation, maintenance, and terminal care. Patient outcome was viewed as the actual functioning of a patient at the time of discharge. This system has been used in several studies which have examined financial and clinical outcomes of home health care (Harris, Santoferraro, & Silva, 1985; Harris, Peters, & Yuan, 1987; Harris, 1991).

The Visiting Nurse Association (VNA) of Omaha has conducted a well known research project in which a patient classification system for community health nursing was developed (Martin et al, 1986). One aspect of this study was the problem rating scale for outcomes in which outcomes were classified in categories of knowledge, behavior, or status. A five point rating scale was used to further specify the outcome level at each category. The VNA of Omaha currently is conducting its fourth testing, funded by the National Center for Nursing Research, of the Omaha System in which reliability, validity, utility, and generalization potential of the Omaha Classification System are being intensely examined (Martin & Scheets, in press). The Omaha System also has been used by the Nursing Center of the University of Wisconsin-Milwaukee School of Nursing to describe the nursing diagnoses, interventions, and outcomes of the community-based underserved population (Lundeen, Coenen, & Marek, 1991). In addition, this system is being considered for use by other nurse managed centers and parish nurse centers with the anticipation of obtaining comparable data across numerous community-based nursing care practice settings.

Lang and Clinton (1984) completed a critical review of empirical work from 1974 to 1982 designed to assess the quality of nursing care. A total of 164 research studies were reported categorized into structure, process, outcome, structure-process, structure-outcome, process-outcome, and structure-process-outcome. The need for data banks of descriptions or norms of nursing practice was identified, as well as, the inclusion of elements of nursing care in minimum data sets for health care information systems.

The Nursing Minimum Data Set (NMDS) was developed to establish uniform standards for the collection of minimum essential nursing data (Werley & Lang, 1988). The NMDS includes three broad categories of elements which

are (a) nursing care, (b) patient or client demographics, and (c) service elements. The nursing care elements consist of (a) nursing diagnosis, (b) nursing intervention, (c) nursing outcome, and (d) intensity of nursing care. In the NMDS, nursing outcome is defined as an aspect of patient or client health status that is influenced by nursing intervention and recorded at specific times for an episode or encounter of care. The nursing outcome is identified as the resolution status of the nursing diagnosis as resolved, not resolved, or referred for continuing care.

The ANA and specialty nursing organizations have developed multiple sets of standards for nursing practice. One example is the monograph entitled *Outcome Standards for Nursing Care of the Critically Ill* by the American Association of Critical-Care Nurses (1990). Other examples include home health nursing, gerontological nursing, hospice nursing, and psychiatric and mental health nursing practice. The standards have been designed using the format of structure, process, and outcome criteria. The criteria are both nurse and patient focused. These standards represent significant work in outcome identification, outcomes which are sensitive to nursing and all but ignored in current outcome indicator development.

Types of Outcome Indicators

A wide variety of outcome indicators have been used in nursing quality assurance and research studies. In the following section, an overview of the various types of outcome indicators used in nursing is presented (Marek, 1989; Lang & Marek, 1990).

Physiological status is a frequently occurring categories in the literature related to outcomes and includes measures of processes which maintain life (Hegyvary & Haussmann, 1976; Horn & Swain, 1978; Hover & Zimmer, 1978; Howe, 1980; Blom, 1985; Votava, Cleveland, & Hiltunen, 1985; Martin et al, 1986; Sorgen, 1986; Lalonde,

1986; Heater, Becker, & Olson, 1988; Rinke, 1988; Stevens & Pavlides, 1989). Frequent measures in this area include changes in parameters such as blood pressure, pulse, temperature, lung sounds, and blood glucose levels. In addition, skin integrity, weight, and the healing of a wound are often indicators in this area. This category also has been referred to as health status, although measures usually are limited to physiologic measures. Physiologic measures are often more easily quantified than other outcome measures and are often readily available in the client record.

Psychosocial outcome indicators refer to the patterns of behavior, communications, and relationships both intrapersonally and interpersonally of the client (Vincent & Price, 1977; Choi, 1983; Padilla & Grant, 1985; Martin et al, 1986; Sorgen, 1986; Toth, 1988; Dolbee & Creson, 1988; Heater, Becker, & Olson, 1988; Hjelm-Karlsson, 1989; Olson, Heater, & Becker, 1990; Rinke, 1988). Examples of measures in this domain include mentation, emotion, attitude, mood, and affect. Concepts such as coping, social contact, and social functioning also have been incorporated in this category.

Functional measures relate to activities of daily living, mobility, and communication are (Linn, Gurel, & Linn, 1977; Horn & Swain, 1978; Daubert, 1979; Posavac & Carey, 1982; Liem, Chernoff, & Carter, 1986; Lalonde, 1986; Christensen, 1987; Morris & Buckwalter, 1988; Wilson, 1988; Buchanan, 1988; Rinke, 1988; Myles, 1989). Another category which could be merged with functional measures is self care. In this category the locus of functioning is often expanded beyond the client to include the client's family and/or caregivers.

In the behavior domain activities, skills, and actions presented by the client are included (Marston, 1970; Horn & Swain, 1978; Hover & Zimmer, 1978; Given, Given, & Simoni, 1979; Sullivan & Armignacco, 1979; Howe, 1980; Sorgen, 1986; Heater, Becker, & Olson, 1988; Martin et al,

1986; Hilbert, 1988; Rinke, 1988). Areas referred to in this domain include application of knowledge and skills, problem solving, compliance, motivation, and therapeutic competence.

Knowledge is the next type of outcome indicator identified (Hover & Zimmer, 1978; Gallant & McLane, 1979; Given, Given, & Simoni, 1979; Hageman & Ventura, 1981; Hill, 1986; Sorgen, 1986; Martin et al, 1986; Lalonde, 1986; Heslop & Bagnall, 1988; Rinke, 1988). It refers to the cognitive level of understanding of the client. Specific areas of knowledge in the literature include knowledge of nursing problems, diet, medications, and treatments. Knowledge as an outcome measure has received greater attention recently due to the increase in the amount and acuity of the care clients are expected to provide to themselves.

Another category that is closely related to physiological measures is symptom control (Sorgen, 1986; Davis et al, 1986; LaLonde, 1986; Davis, 1988; Hyman et al, 1989). The most frequently occurring symptoms utilized as outcome measures include pain and comfort. Examples of other symptom measures include fatigue, nausea, constipation, incontinence, and diarrhea.

Quality of life is a broad category that focuses on outcome measures beyond biological functioning (Padilla & Grant, 1985; Sorgen, 1986; Caldwell, 1988). Quality of life measures include dimensions such as life satisfaction, well-being, symptom control, standard of living, and functional capacity. This category is reliant on the patient perception of subjective experiences in life and requires the collection of concepts that are more qualitative than traditional clinical endpoints (Ware, 1991).

The next category is home functioning which is a crucial area, especially in home health care (Votava, Cleveland, & Hiltunen, 1985; Sorgen, 1986; Dolbee & Creason, 1988; Hazlett, 1989; Myles, 1989). This category refers to

the functioning of the client in the home environment. Areas in this domain include family living patterns, home environment, support, and role function.

Family strain is another measure that has been examined in nursing studies (Votava, Cleveland, & Hiltunen, 1985; LaLonde, 1986; Sorgen, 1986; Foxall & Watson, 1988; Caldwell, 1988; Allen, Becker, & Swank, 1991). The functioning of the family caregiver often is a critical component of the patient's recovery at home as well as in the acute care facility.

Goal attainment as a measure of quality is another category of outcome measures (Daubert, 1979; Inzer & Aspinall, 1981; Sorgen, 1986; King, 1988). In this type of measure, expected outcomes or goals are determined at the beginning of care and the attainment of the goals is measured at designated intervals or at discharge of the client from care. This type of outcome measurement is more sensitive to individual client differences and outcome achievement.

Utilization of service is often used as an outcome measure. This refers to use of health care resources and can include items such as length of hospital stay, number of clinic visits, and rehospitalization (Anderson, 1977; Sullivan & Armignacco, 1979; Brooten et al, 1986; Marchette & Holloman, 1986; Finkler, Brooten, & Brown, 1988; Kane et al, 1989; Miller, 1989; Stevens & Pavlides, 1989). These measures are more easily accessible in health care facilities. Lang et al (1990) used an outcome framework of overuse and underuse of services by older people in a review of 4758 papers on the quality of health care for older people. Resource use can be a negative or positive outcome depending on its context. An example of a positive outcome related to high resource use would be if a client was referred and utilizing services which were available to assist the client to independence. However, frequent use of resources could be a negative outcome, for example, if a client has made unnecessary trips to the emergency room for problems which

could have been addressed by a home care visit. Utilization measures also are converted to financial terms such as cost of an episode of care or treatment (Fagin & Jacobsen, 1985; Ventura et al, 1985; U. S. Congress 1986; Brooten et al, 1986; Wolf, Lesic, & Leak, 1986; Neidlinger, Scroggins, & Kennedy, 1987; Dolbee & Creason, 1988; Gamroth, 1988; Hogan & Roher, 1989; Mitchel et al, 1989).

Safety is another outcome indicator mentioned in the nursing literature (Votava, Cleveland, & Hiltunen, 1985; Buddi, 1987). Many nursing interventions are targeted at providing the outcome of safety such as fall prevention. In addition, the use of devices such as Hickman catheters and mechanical ventilation has made safety a more critical outcome, especially in the home environment.

Resolution of nursing diagnosis or nursing problems is another outcome category (Werley & Lang, 1988; Felman & Richard, 1988; Keating, 1988; Kerr, Rudy, & Daly, 1991). This category overlaps with the majority of other categories. Since nursing diagnoses are often more temporary than medical diagnoses, the resolution of nursing diagnoses would be more sensitive to changes in client health status. If all relevant nursing diagnoses were identified during an episode of client care, the resolution of nursing diagnoses at designated intervals, such as discharge, would yield valuable data regarding the nursing needs of clients, as well as, the effectiveness of nursing interventions.

Patient satisfaction has become more popular in recent years as a critical component in the measurement of the quality of care (Greenfield, et al, 1975; Graham, 1978; Hill, 1986; Hinshaw, Scofield, & Atwood, 1981; Ventura et al, 1982; Koerner, Cohen, & Armstrong, 1985; U.S. Congress, 1986; LaMonica et al, 1986; Erickson, 1988). This is a difficult dimension to measure due to a general patient bias to answer favorably. In addition, tools which can discriminate actual changes in patient satisfaction are difficult to develop.

There has been much discussion in the nursing literature related to caring as an outcome versus a process (Shiber & Larson, 1991; Lang & Krejci, 1991; Valentine, 1991). Outcomes associated with caring are multidimensional, however, the patient's subjective perception related to care provided is a key component (Paulen & Rapp, 1981; Coffey & Reagan, 1984; Laffrey, 1990). Considerable debate can be found in nursing regarding the need for a balance of quantitative and qualitative methodologies (Benner & Wrubel, 1989; Westra, 1991). Over the years nursing has been warned that quantification may destroy the essence of nursing (Lewis, 1976). Further development of caring outcomes is one way that nursing can balance the reductionistic focus of the current health care system.

Influence of Contemporary Projects

Health care is entering into a new era in which the use of health care data and information has never been as critical. Advances in computer technology have enabled the collection of complex data bases and use of sophisticated analytic techniques.

The data collected in health care information systems is used to direct health care policy and affects the standard of care delivered. This information is used to establish reimbursement, determine access to health care, define services, and monitor the quality of care. In addition, it is the patient and service characteristics collected in health care data bases that define what information must be collected by health care providers.

Although large national data bases exist, the major focus has been on patient demographics, medical diagnoses, medical procedures, and health care costs. Data bases related to utilization and outcomes of health care are in the formative stages. Large data sets are needed to perform sophisticated multivariate analysis. If nursing data are not

included in these large data sets the impact of nursing care will remain largely unmeasured and invisible (Mallison, 1990).

The need for nursing data and a classification system for these data has never been more important. The ANA has recommended that data include the NMDs elements with high priority given to nursing diagnoses, interventions, outcomes, and nurse providers (O'Connor, 1990).

There currently are several national data bases that merit close attention by the nursing community. The first is the Uniform Clinical Data Set (UCDS) which is being developed by the Health Care Financing Administration (HCFA) for use by the Peer Review Organizations (PROs) (Lohr, 1990). Second is the Uniform Minimum Data Set (MDS) which is designed to provide case mix information for all nursing facilities in the nation (Health Care Financing Administration, 1990). Third is the Uniform Needs Assessment Instrument which will provide data on the needs of patients for post hospital extended care services, home health services, and long-term care services of a health-related or supportive nature (Lohr, 1990). Finally, there is the indicator development project of the Joint Commission on Accreditation of Healthcare Organizations (JCAHO). In this project a national performance measure database will be established for ongoing monitoring of organizational performance (Nadzam, 1991).

The development of guidelines by the Agency for Health Care Policy and Research (AHCPR) has had a major impact on nursing and nursing on the AHCPR (1990). It is critical that nurses be multidisciplinary partners in guideline development panels that address specific conditions where medical intervention is primary, as well as, all aspects of preventative, acute, and long term care. At the same time, the nursing profession should develop guidelines for areas in which nursing intervention is primary, for which costs are high, in which large patient populations are affected, and for

which there is an established data base. Bergstrom's research on the prevention of skin breakdown should be used as an example or prototype (Bergstrom, 1991). Her own basic clinical research provided direction for the diagnosis, prevention, and treatment of skin integrity (Sponsored by NCNR). Her research findings will be integrated with findings of other research as part of the guideline development process for the AHCPR Guidelines Development and Dissemination Project. The use of these guidelines as one determinate of what should be included in data bases is yet to be developed. This development would lead to the use of data elements identified in guideline development in describing conditions, treatments, and outcomes of large groups of people. Other examples that provide models for nursing research are the Guidelines for Incontinence co-chaired by Kathleen McCormick and Guidelines for Pain co-chaired by Ada Jacox.

A Framework for Outcomes Research

In 1980, the ANA issued Nursing: A Social Policy Statement in which four defining characteristics of nursing are specified (American Nurses Association, 1980). These characteristics include phenomena, theory application, nursing action, and evaluation of effects of action in relation to phenomena. The evaluation of the outcomes of nursing action reflects the effectiveness of the nursing actions in resolving or improving the condition or diagnosis to which actions were directed. Thus, the need to identify outcomes was reaffirmed.

Since most outcomes are influenced by a wide variety of structures and interventions, any single discipline's approach would be narrow and limited. Therefore, there is the need to not only to study nursing interventions separately, but also to integrate these interventions with those of other disciplines to measure multiple influences on outcomes. For example, when studying interventions for the diagnosis of fractured hip, open reduction and hip replacement interven-

tions are included. Complementarily, it is essential to include a matrix of such nursing problems and diagnoses as immobility, confusion, sleep disturbance, pain, incontinence and the associated nursing interventions. Further, it is essential to follow these patients from home to hospital to nursing home to home not only based upon the medical diagnoses but also using the referent nursing diagnoses. Ultimately, the effectiveness is measured by answering the questions: Can the person walk, talk, manage pain and continence, etc.?

Nursing must build on its rich research history. For example, in 1975 Bloch proposed a comprehensive model for quality assessment research that should be revisited as we research the effectiveness of nursing care. In this model she proposed extensive testing of process-outcome relationships in nursing practice (Bloch, 1975).

Nursing scholars must continue to perform “horizontal” research in which the relationship between a specific phenomena of nursing (nursing diagnoses), nursing action (interventions), and the effects of actions (outcomes) are identified. In addition, “vertical” research must continue with the aim to develop and refine a classification of the phenomena of nursing, including nursing diagnoses/problems, nursing interventions, and nursing sensitive outcomes (North American Diagnosis Association, 1987; Werley & Lang, 1988; American Nurses Association, 1989; Peters, 1989; Bulechek & McCloskey, 1990; Jacox, 1990; Grobe, 1991; Maas, 1991; Saba et al, 1991). Results or findings from this basic “horizontal” and “vertical” research supported by the National Institutes of Health (NIH) National Center for Nursing Research must then be used in guideline development and dissemination, as well as, in the effectiveness research and health services research supported by the AHCPR and other agencies.

In summary, Nursing has a rich history of identifying and using relevant patient outcomes. The relationship of outcomes to process and structure variables requires a naming and categorization of these variables. Consensus about the naming of the variables is needed among nurses in practice, in research, and in organized nursing. The clinical testing of these variables is the basis for a clinical research outcome agenda. The seating of these variables into large data sets such as Medicare claims data and uniform clinical data sets will enhance the ability of researchers to identify patterns of effective nursing care. The challenge for the research agenda is to build upon the outcome work that has already been done within nursing and to move the past and present nursing research into an interdisciplinary effort where the impact of multiple interventions and providers can be studied.

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